

Trend Study 22-8-03

Study site name: Muley Point.

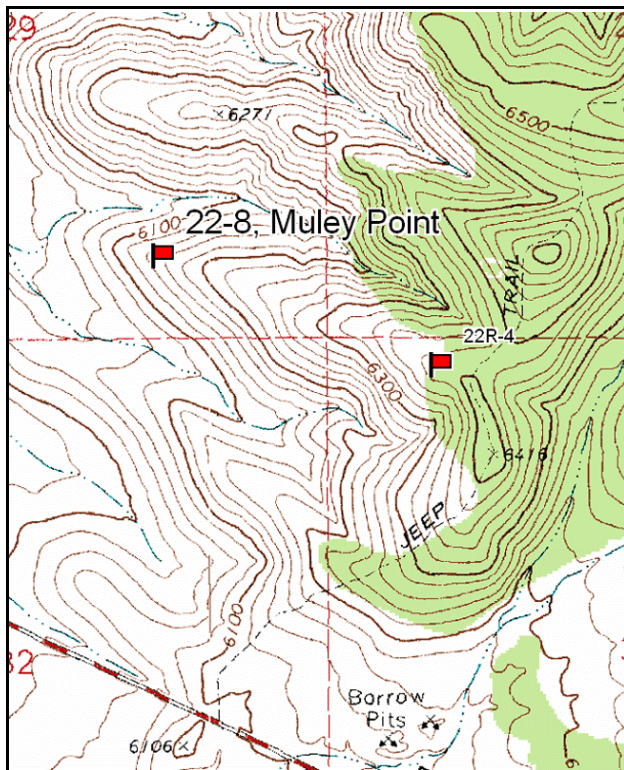
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

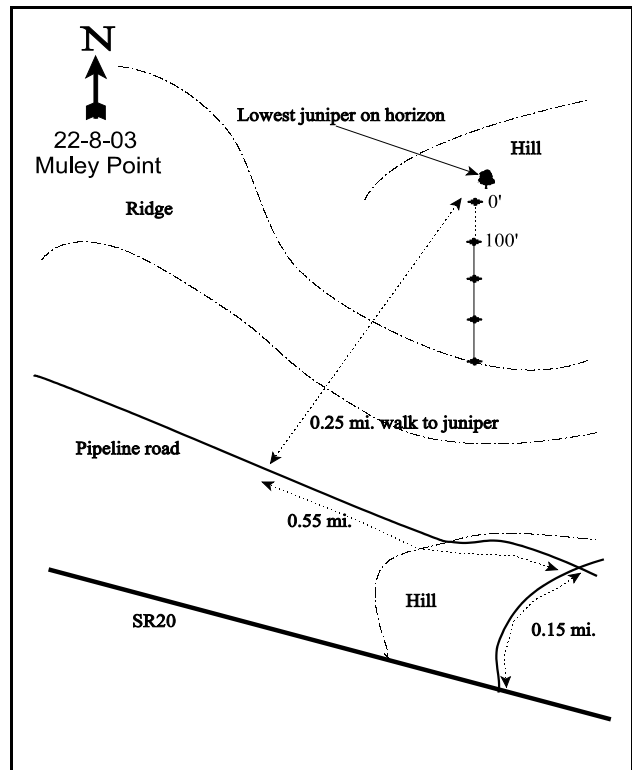
LOCATION DESCRIPTION

From exit #95 on I-15 (junction with SR 20), go to the east side of the freeway, then go 1.2 miles east from the cattleguard on SR 20 to a small wooden H in the fence on the left. Go north through the gate for 0.15 miles to a 4-way intersection. Turn left on the pipeline road and go 0.55 miles then stop. On the ridge to the north locate the lowest juniper on the skyline. Walk to the juniper which is about 1/4 mile away. The baseline starts 10 feet south of the juniper. The 0-foot stake consists of a 3-foot rebar with browse tag #7051 attached.



Map Name: Buckhorn Flat

Township 31S, Range 7W, Section 29



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4215186 N, 353663 E

DISCUSSION

Muley Point - Trend Study No. 22-8

The Muley Point trend study is located on a ridge overlooking an expansive sagebrush valley. The transect lies about one mile east of Interstate 15 and three-fourths of a mile north of Highway 20. The study is on BLM administered land at an elevation of 6,200 feet. On the site, and for many miles around, the vegetation is dominated by dense, low growing Wyoming big sagebrush. The site has a moderately steep slope ranging from 17%-25% and aspect is to the southwest. The winter range on the adjacent Panguitch unit (28) is increasingly threatened by the elimination of sagebrush and conversion to agricultural fields where deer are excluded. This in effect, concentrates deer use on the remainder of the public land on unit 22 (Beaver). Pinyon-juniper density gradually increases to the east as you approach the mountains and gain elevation. Moderately heavy deer use occurs in the winter as evidenced by pellet group transect data. Deer use was estimated at 80 days use/acre (198 ddu/ha) in 1998 and 83 days use/acre (205 ddu/ha) in 2003. A few cattle pats were sampled in 2003 that were from the previous grazing season. Most of the deer pellet groups were from the winter use.

Soils have a sandy clay loam texture and a neutral pH (7.3). The average effective rooting depth was estimated at 11 inches in 1998. Soil temperature averaged 62°F at 13 inches in 1998 and nearly 70°F in 2003 indicating a dry soil profile. Plant development may be limited due to relatively low amounts of phosphorous (5.8 ppm). The soil surface is heavily armored by rock and pavement cover which provide about 60% average cover combined. Rock and pavement are also present throughout the soil profile. The rocks appear to be from basaltic parent material with some exhibiting calcite deposits. Erosion is minimal with little bare ground cover. Most of the bare soil occurs in shrub interspaces. Litter cover is only fair on this site ranging from 20-30%. There appears to be a hardpan or compacted soil layer about 12 inches below the soil surface which could be limiting to root development. Soils were rated as stable from an erosion condition class assessment completed in 2003.

Although two subspecies of big sagebrush are present on the site but Wyoming big sagebrush is dominate and the only sagebrush to occur in the density strips. Basin big sagebrush is more abundant below the transect within the drainage channels. Density of Wyoming big sagebrush was estimated at 3,340 plants/acre in 1998 and 3,140 in 2003. Recruitment by the young age class was moderate in 1998 (11%) but low in 2003 (1%). Although reproduction was low in 2003, most of the population displayed surprisingly good vigor especially with the drought conditions. Mature sagebrush plants averaged nearly two feet in height in 1998 and 2003. Utilization has been mostly moderate overall, but use varies depending on plant location. Plants closer to the ridgetop receive the heaviest use. Sagebrush plants were noted as having an abundant number of leaders in 2003, although growth was low averaging less than one inch of annual leader growth in mid-June. Percent decadence was extremely high in 1991 at 75%, but has been more moderate in other years. Photographs between sampling years indicate a thinning of the Wyoming big sagebrush population. Although pinyon and Utah juniper trees are sparse on the study area, they do provide some thermal cover and have all been highlined to about 5 feet.

The herbaceous understory continues to be rather sparse and stunted. Photographs from 1985 and 1991 show no or little cheatgrass was present on the site. In 1998 and 2003, cheatgrass was by far the most common grass and provided a dense carpet throughout the shrub interspaces. Frequency and cover of cheatgrass did decline in 2003 with the drought conditions, but it still remains abundant enough that with normal precipitation will present a serious fire hazard. Most of the other grasses and forbs are found growing under the protection of sagebrush canopies. Perennial grasses include Indian ricegrass, bottlebrush squirreltail, purple three-awn, galleta, and needle-and-thread grass. Indian ricegrass increased in frequency in 2003 while squirreltail declined. Several desirable perennial forbs occur on the site including scarlet globemallow and browse milkvetch. However, these species occur sporadically. Browse milkvetch significantly declined in

nested frequency and average cover in 2003 with drought.

1985 APPARENT TREND ASSESSMENT

Now that the surface is covered by a layer of erosion pavement and rock, the soil surface appears basically stable. The indicators also point to a static vegetative trend. Populations appear stable, and the plant composition is not likely to change for a long time unless there is increased browsing pressure from livestock and deer.

1991 TREND ASSESSMENT

The soil trend appears to be stable. However, vegetational basal cover is very low at 1%. Percent cover for the other basic categories has changed very little. The key browse species, Wyoming big sagebrush, has decreased in density by 40%, while percent decadence has more than doubled to 75%. With the high density of 8,132 plants/acre in 1985, this poor site in conjunction with the extended drought has caused a great deal of thinning within the community. The population should stabilize at a somewhat lower density, but this trend should be monitored closely. Trend for browse is down. The narrative for the herbaceous understory is similar. The sum of nested frequency for both grasses and forbs has dropped substantially since 1985. The only event that can help improve this site is an end this prolonged drought.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - down (1)

1998 TREND ASSESSMENT

The soil trend continues to be stable with little erosion apparent. Percent rock and pavement cover has slightly declined over all years, while percent bare ground has stayed relatively similar. The browse trend is downward. Wyoming big sagebrush percent decadence has declined from a high of 75% in 1991 to 37% in 1998, although this is still higher than the 1985 estimate of 28%. The population is slowly declining with low numbers of seedling or young plants encountered in 1998. Thirty-nine percent of the decadent age class was classified as dying, an increase from 16% in 1991. The dense carpet of cheatgrass in the shrub interspaces provides excessive competition for sagebrush seedling establishment. The herbaceous understory trend is slightly down. Although perennial herbaceous understory sum of nested frequency has increased, the dense cheatgrass carpet that was not present in the past is a severe fire hazard which could ultimately eliminate the Wyoming big sagebrush population and the value of this area as deer winter range. Perennial grasses and forbs need to increase in abundance to decrease the possibility of a devastating fire.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - slightly down (2)

2003 TREND ASSESSMENT

Trend for soil is stable. Vegetation, litter, and bare ground cover all declined in 2003 while rock and pavement cover increased. An increase in rock and pavement cover indicates some soil movement on the site, but erosion is not currently severe. Trend for browse is stable. Wyoming big sagebrush density declined slightly due to a decreasing young age class, but percent decadence remains stable and the proportion of decadent, dying plants decreased. Vigor throughout the population has not changed although heavy use

increased to 24%. Trend for the herbaceous understory is slightly down. Perennial grasses and forbs have lower sum of nested frequency values since 1998. The main positive factor in the understory is the decline in cheatgrass cover and frequency. However, this is due to drought conditions and will likely reverse in the future with better precipitation.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Management unit 22 , Study no: 8

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	<i>Aristida purpurea</i>	a ⁻	b ¹¹	b ²⁶	ab ⁶	.32	.15
G	<i>Bromus tectorum</i> (a)	-	-	b ³⁴²	a ²³⁸	13.36	4.50
G	<i>Hilaria jamesii</i>	a ⁻	a ⁻	ab ⁸	b ⁹	.19	.07
G	<i>Oryzopsis hymenoides</i>	a ⁴⁴	ab ⁶⁷	ab ⁷⁷	b ¹⁰¹	2.42	3.80
G	<i>Sitanion hystrix</i>	c ¹⁷⁹	b ¹⁰¹	ab ⁹¹	a ⁵⁷	1.56	.63
G	<i>Stipa comata</i>	11	-	4	1	.04	.01
Total for Annual Grasses		0	0	342	238	13.36	4.50
Total for Perennial Grasses		234	179	206	174	4.53	4.68
Total for Grasses		234	179	548	412	17.90	9.18
F	<i>Astragalus cibarius</i>	ab ¹⁸	b ²¹	b ³⁷	a ²	5.86	.01
F	<i>Astragalus</i> spp.	-	2	-	-	-	-
F	<i>Chaenactis douglasii</i>	c ²¹	bc ¹⁵	ab ⁴	a ⁻	.02	-
F	<i>Cryptantha</i> spp.	-	3	-	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	-	2	3	.03	.01
F	<i>Eriogonum cernuum</i> (a)	b ³⁹	a ¹⁰	a ¹	b ⁴¹	.00	.37
F	<i>Erodium cicutarium</i> (a)	-	-	-	1	-	.00
F	<i>Gilia</i> spp. (a)	-	-	a ⁻	b ²⁸	-	.26
F	<i>Holosteum umbellatum</i> (a)	-	-	-	3	-	.00
F	<i>Leucelene ericoides</i>	a ⁻	a ⁻	b ¹⁰	b ¹²	.12	.37
F	<i>Phlox hoodii</i>	-	-	-	1	-	.00
F	<i>Phlox longifolia</i>	-	-	4	4	.01	.01
F	<i>Sphaeralcea coccinea</i>	a ⁴	a ⁴	b ²⁰	b ²¹	.31	.38
F	Unknown forb-perennial	b ¹⁴	a ⁻	a ⁻	a ⁻	-	-
Total for Annual Forbs		39	10	3	76	0.03	0.66
Total for Perennial Forbs		57	45	75	40	6.34	0.78
Total for Forbs		96	55	78	116	6.38	1.44

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 22 , Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata wyomingensis	81	71	14.77	14.80
B	Chrysothamnus viscidiflorus stenophyllus	0	1	-	-
B	Opuntia whipplei	1	0	.00	-
Total for Browse		82	72	14.77	14.80

CANOPY COVER, LINE INTERCEPT --

Management unit 22 , Study no: 8

Species	Percent Cover
	'03
Artemisia tridentata wyomingensis	13.88

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 22 , Study no: 8

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	0.93

BASIC COVER --

Management unit 22 , Study no: 8

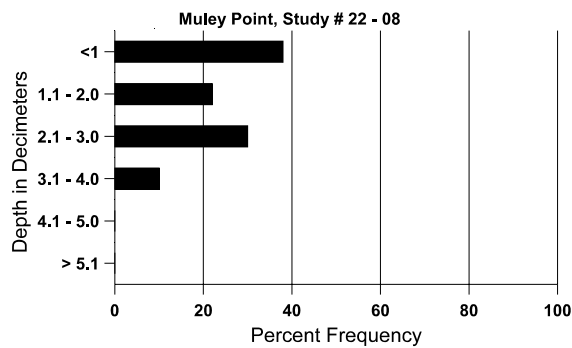
Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	2.00	1.00	33.02	28.21
Rock	16.25	17.75	17.63	17.90
Pavement	46.25	42.25	33.62	42.55
Litter	24.25	28.25	29.89	19.68
Cryptogams	0	0	.01	.22
Bare Ground	11.25	10.75	11.50	6.22

SOIL ANALYSIS DATA --

Management unit 22, Study no: 8, Study Name: Muley Point

Effective rooting depth (in)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	ds/m
11.2	69.8 (10.9)	7.3	52.0	27.4	20.6	1.3	5.8	156.8	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 22, Study no: 8

Type	Quadrat Frequency		Days use per acre (ha)	
	'98	'03	'98	'03
Rabbit	29	14	-	-
Cow	-	-	-	1 (2)
Deer	53	18	80 (198)	83 (205)

BROWSE CHARACTERISTICS --

Management unit 22, Study no: 8

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis											
85	8132	133	1200	4666	2266	-	42	0	28	6	17/22
91	4865	333	66	1133	3666	-	41	19	75	15	17/19
98	3340	40	380	1720	1240	860	63	1	37	14	22/28
03	3140	-	40	1880	1220	720	64	24	39	13	23/31
Chrysothamnus viscidiflorus stenophyllus											
85	66	-	-	66	-	-	0	0	-	0	9/4
91	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	-	0	-/-
03	20	-	-	20	-	-	0	0	-	0	6/9

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Coryphantha vivipara											
85	0	-	-	-	-	-	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	-	0	11/24
Opuntia whipplei											
85	200	-	-	200	-	-	0	0	-	0	7/7
91	66	-	-	66	-	-	0	0	-	0	8/11
98	20	-	-	20	-	-	0	0	-	0	7/12
03	0	-	-	-	-	-	0	0	-	0	5/12